

IN THE CLAIMS:

1. **(Currently amended)** A coated metallic implant comprising a metallic implant having a surface and an outer layer, wherein the outer layer comprises a bone analogous coating comprising a collagen matrix mineralized with a calcium phosphate phase which is adhered to said implant surface, wherein the mineralized collagen matrix is constructed in the form of layers, whereby at least one of said layers comprises a composite of mineralized collagen fibrils, amorphous calcium phosphate and crystalline hydroxyapatite, wherein the crystals of said crystalline hydroxyapatite have a length of about 300 to 500 nm and wherein said metallic implant is prepared by a process comprising:
  - a) coating a metallic implant material by immersion in a collagen solution at a pH of less than 8 and a temperature between 4 – 40 °C, and
  - b) coating said metallic implant material with a calcium phosphate phase (CCP) in a electrochemically assisted process by means of cathodic polarization in an electrolyte solution comprising calcium ions and phosphate ions,wherein process steps a) and b) are performed simultaneously or sequentially.
2. (Cancelled)
3. (Previously presented) A coated metallic implant according to Claim 1, wherein the calcium phosphate phase of the matrix further contains octacalcium phosphate ( $\text{Ca}_8\text{H}_2(\text{PO}_4)_6 \cdot 5\text{H}_2\text{O}$ ), brushite ( $\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$ ) or mixtures thereof.

4. (Previously presented) A coated metallic implant according to Claim 1, wherein the calcium phosphate phase is doped with fluoride, silver, magnesium or carbonate ions or combinations thereof.
5. (Previously presented) A coated metallic implant according to Claim 1, wherein the collagen is collagen of type I.
6. (Previously presented) A coated metallic implant according to Claim 1, wherein the collagen is a mixture of collagen of types I to III.
7. (Previously presented) A coated metallic implant according to Claim 1, wherein said coating further contains gelatin.
8. (Previously presented) A coated metallic implant according to Claim 1, further containing growth factors, peptide sequences, hormones, antibiotics or mixtures thereof.
9. (Cancelled)
10. (Previously presented) A coated metallic implant according to Claim 1, wherein the metallic implant is made of titanium or titanium alloy.
11. (Cancelled)
12. (Currently amended) A coated metallic implant according to Claim 1 ~~44~~, wherein an additional process step b) is placed in front of process step a).
13. (Currently amended) A coated metallic implant according to Claim 1 ~~44~~, wherein the process steps a) and b) proceed alternately a number of times.

14. (Currently amended) A coated metallic implant according to Claim 1 ~~11~~, wherein the process steps a) and b) are combined into one step, the metallic implant material to be coated being electrochemically polarized cathodically in a collagen solution comprising calcium ions and phosphate ions.
15. (Currently amended) A coated metallic implant according to Claim 1 ~~11~~, wherein a cathodic current flow of -0.2 to -50 mA/cm<sup>2</sup> flows for 25 to 40 minutes during the galvanostatic polarization in process step b).
16. (Currently amended) A coated metallic implant according to Claim 1 ~~11~~, wherein the mineralised collagen matrix is layered.
17. (Currently amended) A coated metallic implant according to Claim 1 ~~11~~, wherein the coating further comprises gelatin.
18. (Currently amended) A coated metallic implant according to Claim 1 ~~11~~, wherein a cathodic current flow of -0.5 to -30 mA/cm<sup>2</sup> flows for 30 to 40 minutes during the galvanostatic polarization in process step b).
19. (Currently amended) A coated metallic implant according to Claim 1 ~~11~~, wherein a cathodic current flow of -1 to -10 mA/cm<sup>2</sup> flows during the galvanostatic polarization in process step b).
20. (Cancelled)
21. (Previously presented) A coated metallic implant according to Claim 1, wherein the outer layer is 0.04-150 nm thick.
22. (Cancelled)

23. (Previously presented) A coated metallic implant according to Claim 1, wherein the metallic implant is made of titanium or titanium alloy.
24. (Previously presented) A coated metallic implant according to Claim 1, wherein the outer layer is 0.04-150 nm thick and said crystals have a diameter of 50-60 nm.
25. (Previously presented) A coated metallic implant according to Claim 24, wherein the metallic implant is made of titanium or titanium alloy.
26. (Previously presented) A coated metallic implant comprising a metallic implant and a coating made of a collagen matrix mineralized with a calcium phosphate phase wherein the calcium phosphate phase is doped with fluoride, silver, magnesium or carbonate ions or combinations thereof and the collagen is a mixture of collagen of types I to III.
27. (Previously presented) A coated metallic implant according to Claim 1, wherein the coating is obtained by precipitating calcium phosphate from a solution in the presence of collagen.
28. (New) A coated metallic implant comprising a metallic implant having a surface and an outer layer, wherein the outer layer comprises a bone analogous coating comprising a collagen matrix mineralized with a calcium phosphate phase which is adhered to said implant surface, wherein the mineralized collagen matrix is constructed in the form of layers, whereby at least one of said layers comprises a composite of mineralized collagen fibrils, amorphous calcium phosphate and crystalline hydroxyapatite, wherein the crystals of said crystalline hydroxyapatite have a length of about 300 to 500 nm.